

FIG. 1

Photokilling of different microorganisms using methylene blue-benzalkonium mediated photodynamic therapy.

Organism	Methylene	Benzalkonium	Power ^a	Dose	Light	Treatment	
	Blue (μ g/mL)	(%)	(W)	Rate (mW/cm ²)	Dose (J/cm ²)	No Light	Light
<i>C. albicans</i> (patient iso.)	0	0.0075	N/a ^b	N/a	N/a	3 ^c	N/a
	100	0	113	100	40	N/a	2
	100	0.005	"	"	"	N/a	0
<i>C. albicans</i> 14053	0	0.0075	N/a	N/a	N/a	2 (19)	N/a
	100	0	113	100	30	N/a	1 (3)
	100	0.005	"	"	"	N/a	0
<i>E. coli</i> 35218	0	0.0075	N/a	N/a	N/a	2	N/a
	50	0	113	100	30	N/a	2
	50	0.005	"	"	"	N/a	1
	50	0.0075	"	"	"	N/a	0
<i>E. faecalis</i> 51229	0	0.0075	N/a	N/a	N/a	2 (13)	N/a
	50	0	113	100	30	N/a	0
	50	0.005	"	"	"	N/a	0
<i>H. influenzae</i> (patient iso.)	0	0.005	N/a	N/a	N/a	2	N/a
	50	0	113	100	30	N/a	0
	50	0.005	"	"	"	N/a	0
<i>K. pneumoniae</i> 13882	0	0.0075	N/a	N/a	N/a	2	N/a
	50	0	113	100	30	N/a	0
	50	0.005	"	"	"	N/a	0
<i>P. aeruginosa</i> 27853	0	0.01	N/a	N/a	N/a	2	N/a
	100	0	113	100	40	N/a	4
	100	0.01	"	"	"	N/a	0
<i>S. marcescens</i> (patient iso.)	0	0.0075	N/a	N/a	N/a	0	N/a
	50	0	113	100	30	N/a	0
	50	0.005	"	"	"	N/a	0
<i>S. aureus</i> 29213	0	0.0075	N/a	N/a	N/a	1 (4)	N/a
	50	0	113	100	30	N/a	1
	50	0.005	"	"	"	N/a	0
<i>S. pneumoniae</i> 49619	0	0.005	N/a	N/a	N/a	0	N/a
	50	0	113	100	30	N/a	0
	50	0.005	"	"	"	N/a	0

^aWavelength = 664 nm.

^bN/a = Not applicable.

^cQualitative score: 0 = no growth, 1 = 1-5, 2 = 6-100, 3 = 101-300, 4 = 301+, () = number of colonies.

FIG. 2

Photokilling of bacterial spores using methylene green-benzalkonium chloride mediated photodynamic therapy.

Organism	Methylene Green (μ g/mL)	Benzalkonium (%)	Power ^a (W)	Dose Rate (mW/cm ²)	Treatment		
					Light Dose (J/cm ²)	No Light	Light
<i>Bacillus subtilis</i> 19659	0	0	N/a ^b	N/a	N/a	4 ^c	N/a
	0	0.3	N/a	N/a	N/a	1 (2)	N/a
	0	0.5	N/a	N/a	N/a	1	N/a
	150	0	170	150	60	N/a	4
	150	0.3	"	"	"	N/a	2 (15)
	150	0.5	"	"	"	N/a	1
	200	0	"	"	"	N/a	4
	200	0.3	"	"	"	N/a	2 (8)
	200	0.5	"	"	"	N/a	1
	250	0	"	"	"	N/a	4
	250	0.3	"	"	"	N/a	0
	250	0.5	"	"	"	N/a	0

^aWavelength = 664 nm.

^bN/a = Not applicable.

^cQualitative score: 0 = no growth, 1 = 1-5, 2 = 6-100, 3 = 101-300, 4 = 301+, () = number of colonies.

FIG. 3

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Photodynamic Therapy of Endotracheal Tubes using Methylene Blue and Benzalkonium Chloride

Patient	Intubation (Days)	Illness	Antibiotic	MB (μ g/mL)	Benz (%)	Treatment Stage ^a		
						M-L- ^b	M+L+ ^c	2L+ ^d
MK	4	Pneumonia	Ceftriaxone	200	0.01	4 ^e	0	0
MS	11	Pneumonia	Rocephin	"	"	4	0	0
MB	1	Surgery	N/a	"	"	0	0	0
NV	3	Pneumonia	Ampicillin	"	"	2	0	0
JF	3	Pneumonia	Primaxim	"	"	2	0	0
SR	3	Pneumonia	Tequin	"	"	4	2	0
AW	2	Surgery	N/a	"	0.0075	4	3	2
MZ	16	Pneumonia	Amt, Cln, Imi, Teq, Van	"	0.0075	4	4	4

N/a = not applicable.

^aLaser criteria: power = 800 mW, dose rate = 300 mW/cm, light dose = 70 J/cm, time = 233 sec.

^bM-L- = no methylene blue or light activation.

^cM+L+ = methylene blue and light activation.

^d2L+ = double light activation.

^eQualitative score: 0 = 0 colonies, 1 = 1-5, 2 = 6-100, 3 = 101-300, 4 = 301+

FIG. 4

F O R E I G N - T R A N S F E R

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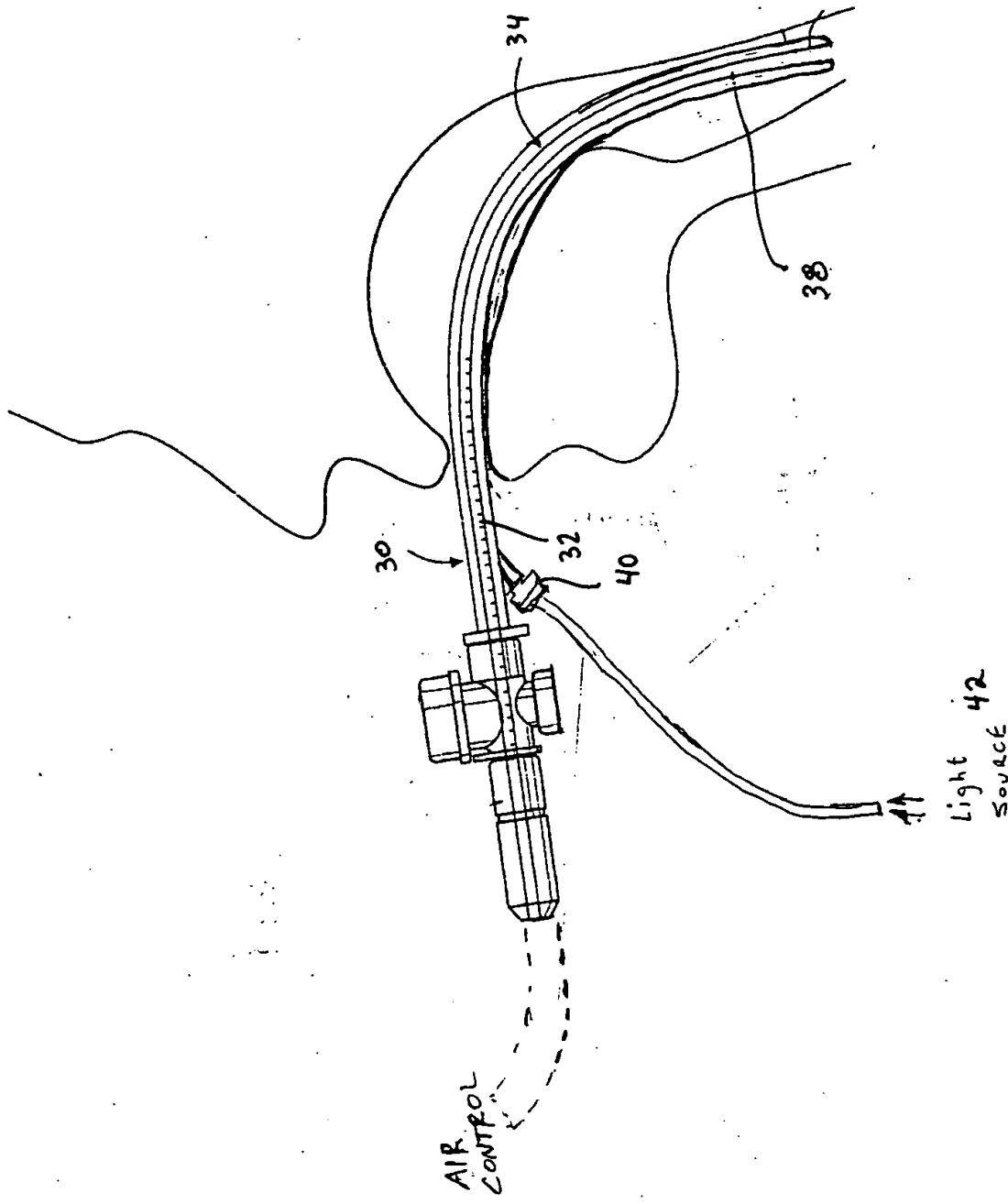


FIG. 5

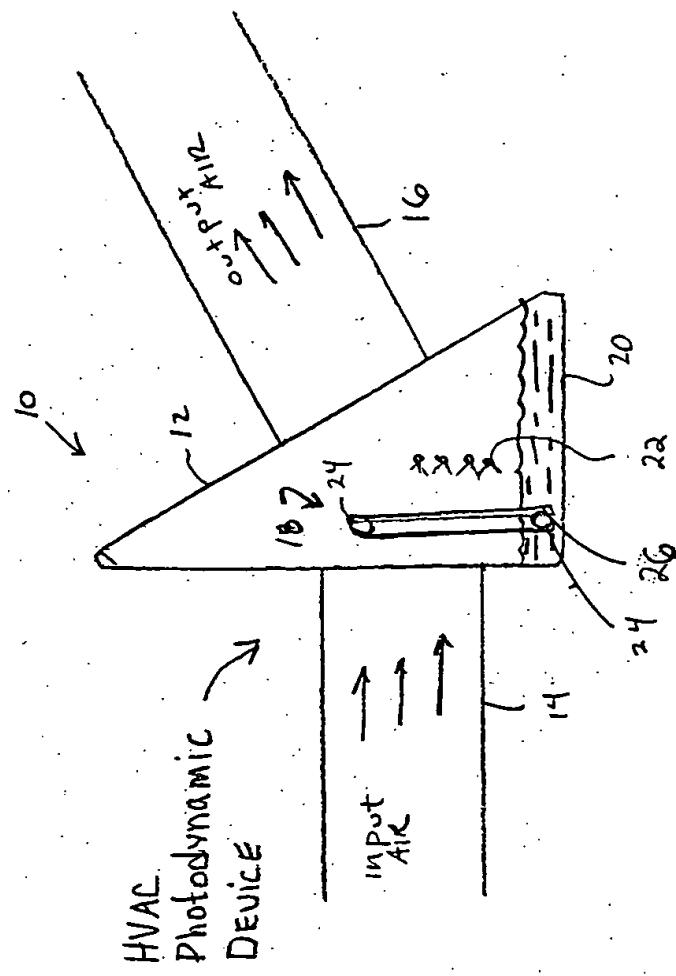


FIG. 6